

Economics 471: Econometrics
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Problem Set #5

1. The following three equations can be estimated using the 1,534 observations in 401K.RAW

$$prate = 80.29 + 5.44mrate + 0.269age - 0.00013totemp$$

$$prate = 97.32 + 5.02mrate + 0.314age - 2.26 \ln(totemp)$$

$$prate = 80.62 + 5.34mrate + 0.290age - 0.00043totemp + 0.0000000039totemp^2$$

- (a) Replicate the results.
- (b) Which of these three models do you prefer? Why?
2. Use the data in GPA2.RAW for this exercise.

- (a) Estimate the model

$$sat = \alpha + \beta_1 hsize + \beta_2 hsize^2 + u$$

where *hsize* is the size of the graduating class (in hundreds). Is the quadratic term statistically significant?

- (b) Using the estimated equation in part (a), what is the optimal high school size? Justify your answer.
- (c) Is this analysis representative of the academic performance of all high school seniors? Explain.
- (d) Find the estimated optimal high school size, using $\ln(sat)$ as the dependent variable. Is it much different from what you obtained in part (b)?
3. Using the housing price data in HPRICE1.RAW we consider the model

$$price = \alpha + \beta_1 lotsize + \beta_2 sqrft + \beta_3 bdrms + u$$

where *price* is the price of the home, *lotsize* is the size of the lot, *sqrft* is the square footage of the house and *bdrms* is the number of bedrooms.

- (a) Estimate the model and obtain the predicted price when *lotsize* = 10,000, *sqrft* = 2,300 and *bdrms* = 4.
- (b) Run a regression that allows you to put a 95% confidence interval around the predicted value in part (a). Note that your prediction will differ somewhat due to rounding error.